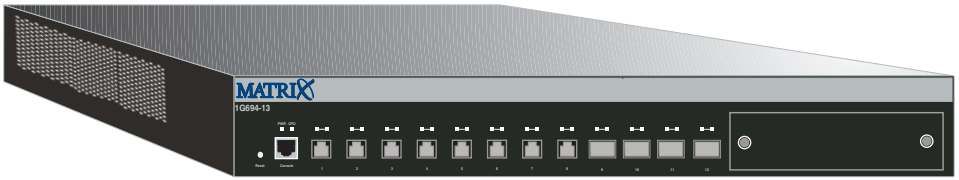
Matrix E1 1G694-13
Installation Guide



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The Class 1 laser transceivers use an optical feedback loop to maintain Class 1 operation limits. This control loop eliminates the need for maintenance checks or adjustments. The output is factory set, and does not allow any user adjustment. Class 1 Laser transceivers comply with the following safety standards:

- 21 CFR 1040.10 and 1040.11 U.S. Department of Health and Human Services (FDA).
- IEC Publication 825 (International Electrotechnical Commission).
- CENELEC EN 60825 (European Committee for Electrotechnical Standardization).

When operating within their performance limitations, laser transceiver output meets the Class 1 accessible emission limit of all three standards. Class 1 levels of laser radiation are not considered hazardous.

When the connector is in place, all laser radiation remains within the fiber. The maximum amount of radiant power exiting the fiber (under normal conditions) is -12.6 dBm or 55 x 10^{-6} watts.

Removing the optical connector from the transceiver allows laser radiation to emit directly from the optical port. The maximum radiance from the optical port (under worst case conditions) is 0.8 W cm^{-2} or 8 x 10^{3} W m^{2} sr-1.

Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

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Application of Council Directive(s):	**89/336/EEC** **73/23/EEC**
Manufacturer's Name:	**Enterasys Networks, Inc.**
Manufacturer's Address:	**50 Minuteman Road** **Andover, MA 01810** **USA**
European Representative Address:	**Enterasys Networks, Ltd.** **Nexus House, Newbury Business Park** **London Road, Newbury** **Berkshire RG14 2PZ, England**
Conformance to Directive(s)/Product Standards:	**EC Directive 89/336/EEC** **EN 55022** **EN 61000-3-2** **EN 61000-3-3** **EN 55024** **EC Directive 73/23/EEC** **EN 60950** **EN 60825**
Equipment Type/Environment:	**Networking Equipment, for use in a Commercial or Light Industrial Environment.**

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Contents

Figures xi
Tables xii

ABOUT THIS GUIDE

Who Should Use This Guide xiii
Structure of This Guide xiv
How to Use This Guide xv
Related Documents xv
Document Conventions xvi

1 INTRODUCTION

1.1 Overview of the 1G694-13 1-1
1.2 Connectivity 1-2
1.3 Management 1-3
1.3.1 Switch Configuration Using WebView 1-3
1.3.2 Switch Configuration Using CLI Commands 1-3
1.4 Standards Compatibility 1-4
1.5 LANVIEW Diagnostic LEDs 1-4
1.6 Getting Help 1-5

2 NETWORK REQUIREMENTS

2.1 1000BASE-SX/LX Network 2-1
2.2 10-Gigabit Ethernet Network 2-2

3 HARDWARE INSTALLATION

3.1 Required Tools 3-1
3.2 Unpacking the Switch 3-2
3.3 Installing Options 3-2
3.4 Installing an Optional Ethernet Expansion Module 3-3
3.4.1 Removing the Front Panel Coverplate 3-3
3.4.2 Installing an Ethernet Expansion Module 3-4
3.5 Installing an Optional Mini-GBIC 3-5
3.6 Installing an Optional XENPAK (10GBASE-LR) Module 3-7
3.7 Tabletop or Shelf Installation 3-9

3.8 Rackmount Installation 3-10
3.8.1 Connecting Power 3-12
3.9 Connecting to the Network 3-13
3.9.1 Connecting Fiber Optic Cables to MT-RJ Ports 3-13
3.9.2 Connecting Fiber Optic Cables to an SC Port 3-15
3.9.3 Network Connection Using Fiber Optic Cable 3-15
3.10 Connecting to Console Port for Local Management 3-18
3.10.1 What Is Needed 3-18
3.10.2 Connecting to an IBM or Compatible Device 3-19
3.10.3 Connecting to a VT Series Terminal 3-20
3.10.4 Connecting to a Modem 3-21
3.10.5 Adapter Wiring and Signal Assignments 3-23
3.11 Completing the Installation 3-25

4 TROUBLESHOOTING

4.1 Using LANVIEW 4-2
4.2 Troubleshooting Checklist 4-5
4.3 Using the Reset Button 4-7

A SPECIFICATIONS

A.1 1G694-13 Specifications A-2
A.2 ZPIM1-01/ZPIM1-06, 10-Gigabit Port Interface Specifications A-3
A.3 Input/Output Specifications for the 10GBASE-LR A-4
A.4 Mini-GBIC Input/Output Specifications A-5
A.5 Gigabit Ethernet Specifications A-5
A.5.1 MGBIC-LC01/MGBIC-MT01 Specifications (1000BASE-SX) A-5
A.5.2 MGBIC-LC03 Specifications (1000BASE-SX) A-6
A.5.3 MGBIC-LC09 Specifications (1000BASE-LX) A-7
A.5.4 MGBIC-08 Specifications (1000BASE-ELX) A-7
A.5.5 MGBIC-02 Specifications (1000BASE-T) A-8
A.6 RJ45 COM Port Pinout Assignments A-9
A.7 Regulatory Compliance A-9

B MODE SWITCH BANK SETTINGS

B.1 Required Tools B-1
B.2 Removing the Chassis Cover B-2
B.3 Setting the Mode Switches B-4

INDEX

Figures

Figure		Page
1-1	Matrix E1 1G694-13 Standalone Switch	1-1
1-2	Optional Ethernet Expansion Modules	1-3
3-1	Removing the Front Panel Coverplate	3-3
3-2	Installing the Ethernet Expansion Module	3-4
3-3	Mini-GBIC Installation	3-6
3-4	XENPAK Module Installation	3-8
3-5	Clearance Required for Tabletop or Shelf Installation	3-9
3-6	Attaching the Rackmount Brackets	3-11
3-7	Fastening the Switch to the Rack	3-11
3-8	AC Power Connections	3-12
3-9	Cable Connection to Mini-GBIC	3-14
3-10	SC Fiber Optic Cable Connection	3-17
3-11	Connecting an IBM PC or Compatible	3-19
3-12	Connecting a VT Series Terminal	3-21
3-13	Connecting to a Modem	3-22
4-1	LANVIEW LEDs	4-2
4-2	Reset Switch	4-7
B-1	Removing the Chassis Cover	B-3
B-2	Mode Switch Location (Chassis, Top View)	B-4

Tables

Table		Page
1-1	Optional Ethernet Expansion Module, Compliance, and Physical Connection	1-3
3-1	Contents of Shipping Carton	3-2
4-1	LANVIEW LEDs	4-3
4-2	Troubleshooting Checklist	4-5
A-1	1G694-13 Specifications	A-2
A-2	ZPIM1-01/ZPIM1-06 Port/Environmental Specifications	A-3
A-3	ZPIM1-01 Optical Specifications	A-3
A-4	Port Input/Output Specifications	A-4
A-5	10GBASE-LR Optical Specifications	A-4
A-6	10GBASE-LR Operating Range	A-4
A-7	Mini-GBIC Input/Output Port Specifications	A-5
A-8	MGBIC-LC01 / MGBIC-MT01 Optical Specifications	A-5
A-9	MGBIC-LC01 / MGBIC-MT01 Operating Range	A-6
A-10	MGBIC-LC03 Optical Specifications	A-6
A-11	MGBIC-LC03 Operating Range	A-6
A-12	MGBIC-LC09 Optical Specifications	A-7
A-13	MGBIC-LC09 Operating Range	A-7
A-14	MGBIC-08 Optical Specifications	A-7
A-15	MGBIC-08 Operating Range	A-8
A-16	MGBIC-02 / Specifications	A-8
A-17	Console Port Pin Assignments	A-9
A-18	Compliance Standards	A-9

About This Guide

This guide provides an overview of the Matrix E1 1G694-13 standalone switch, and instructions to install the 1G694-13, an optional Ethernet expansion module, Mini-GBICs, and XENPAK modules.

For information about the Command Line Interface (CLI) set of commands used to configure and manage the 1G694-13, refer to the Enterasys Networks™ *Matrix E1 1G694-13 Configuration Guide*.

Note: In this guide, the following terms are used:

- *Switch* refers to the 1G694-13.
- *Ethernet expansion module* (or simply *expansion module*) refers to an optional expansion card that plugs directly into an expansion port slot of the 1G694-13.
- *Mini-Gigabit Interface Card (Mini-GBIC)* refers to a smaller optional interface card that plugs into the front panel ports 9 through 12.
- *XENPAK module or 10GBASE-LR* refers to a small 10-Gigabit Ethernet (10 GbE) fiber optic interface module that plugs into the ZPIM1-06 expansion module. The 10GBASE-LR conforms to the XENPAK 10-Gigabit Ethernet standard.

Important Notice

Depending on the firmware version used in the switch, some features described in this document may not be supported. Refer to the Release Notes shipped with the switch to determine which features are supported.

WHO SHOULD USE THIS GUIDE

Electrical Hazard: Only qualified personnel should perform installation procedures.

Riesgo Electrico: Solamente personal calificado debe realizar procedimientos de instalacion.

Elektrischer Gefahrenhinweis: Installationen sollten nur durch ausgebildetes und qualifiziertes Personal vorgenommen werden.

This guide is intended for a network administrator responsible for installing and setting up the 1G694-13 switch.

STRUCTURE OF THIS GUIDE

This guide is organized as follows:

This preface provides preliminary information to help you use this guide and a brief summary of each chapter, defines conventions used in this document, and lists technology and user guides that may help you set up and manage the 1G694-13 switch.

Chapter 1, **Introduction**, provides an overview of the switch, and explains how to contact Enterasys Networks for technical support.

Chapter 2, **Network Requirements**, provides an overview of the network requirements that must be met before installing the switch.

Chapter 3, **Hardware Installation**, provides instructions on how to install the switch on a table top or into a standard 19-inch rack, install an optional Ethernet expansion module, Mini-GBIC, or XENPAK module, and connect segments to the switch and any of its installed options.

Chapter 4, **Troubleshooting**, describes the function of the LANVIEW LEDs and provides troubleshooting procedures to help diagnose switch operational and related network problems.

Appendix A, **Specifications**, contains information on port operating specifications, connector pinouts, environmental requirements, and physical properties for the 1G694-13 and an optional Ethernet expansion module, Mini-GBICs, XENPAK modules, and the media they support. Also provided are cable fiber budget and regulatory compliance information.

Appendix B, **Mode Switch Bank Settings**, describes how to access the Mode Switch Bank and describes how to use its switches to clear NVRAM of all user-entered parameters to reset them to the factory default settings, or clear the user-entered passwords and reset them to the factory default settings. In either case, you can re-enter your user settings.

HOW TO USE THIS GUIDE

For...	Refer to...
An overview of the switch and getting technical support from Enterasys Networks	Chapter 1, **Introduction**
Network requirements that must be met before installing the switch	Chapter 2, **Network Requirements**
Instructions to install the switch hardware and optional modules	Chapter 3, **Hardware Installation**
Troubleshooting installation problems and diagnosing network/operational problems using the LANVIEW LEDs	Chapter 4, **Troubleshooting**
Specifications, environmental requirements, and physical properties for the 1G694-13 and its optional modules	Appendix A, **Specifications**
Instructions to set the mode switches when necessary	Appendix B, **Mode Switch Bank Settings**

RELATED DOCUMENTS

The following document provides the information to configure the switch using the Command Line Interface to set up and manage the switch:

Matrix E1 1G694-13 Configuration Guide

The manual listed above can be obtained from the World Wide Web in Adobe Acrobat Portable Document Format (PDF) at the following site:

http://www.enterasys.com/support/manuals

DOCUMENT CONVENTIONS

This guide uses the following conventions:

Note: Calls the reader's attention to any item of information that may be of special importance.

Caution: Contains information essential to avoid damage to the equipment.

Electrical Hazard: Warns against an action that could result in personal injury or death due to an electrical hazard.

Riesgo Electrico: Advierte contra una acción que pudiera resultar en lesión corporal o la muerte debido a un riesgo eléctrico.

Elektrischer Gefahrenhinweis: Warnung vor sämtlichen Handlungen, die zu Verletzung von Personen oder Todesfällen – hervorgerufen durch elektrische Spannung – führen können!

Warning: Warns against an action that could result in personal injury or death.

Advertencia: Advierte contra una acción que pudiera resultar en lesión corporal o la muerte.

Warnhinweis: Warnung vor Handlungen, die zu Verletzung von Personen oder gar Todesfällen führen können!

1

Introduction

This chapter introduces the Matrix™ E1 1G694-13 standalone switch and provides information on how to contact Enterasys Networks for support.

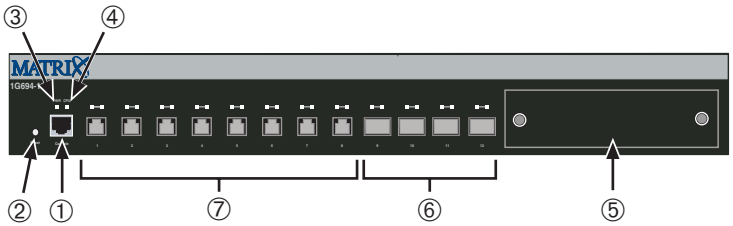
Important Notice

Depending on the firmware version used in the switch, some features described in this document may not be supported. Refer to the Release Notes shipped with the switch to determine which features are supported.

1.1 OVERVIEW OF THE 1G694-13

The 1G694-13 (Figure 1-1) is a standalone switch with eight fixed 1000BASE-SX MT-RJ style ports, four Mini-GBIC style port slots for 1000BASE-SX/LX Mini-GBICs, and one uplink slot for an optional 10-Gigabit Ethernet expansion module.

Figure 1-1 Matrix E1 1G694-13 Standalone Switch



① RJ45 console port
② Reset switch
③ Power LED
④ CPU LED
⑤ 10-Gigabit Ethernet Expansion Module option slot
⑥ Mini-GBIC style port slots
⑦ Fixed 1000BASE-SX Gigabit Ethernet MT-RJ ports

The 1G694-13 switch functions are configured using the WebView™ application, CLI switching commands, or SNMP.

You can install the switch on a tabletop or into a standard 19-inch rack using the rack mounting hardware.

The 1G694-13 has two power supplies. If one power supply fails, the remaining power supply assumes the entire load of the device without interruption to network traffic. Each power supply module has its own ac input connection and must be connected to different ac power circuits for power source redundancy.

1.2 CONNECTIVITY

The switch has twelve, 1-Gigabit Ethernet ports and one 10-Gigabit Ethernet expansion port, which is via an optional expansion module.

1-Gigabit Ethernet Ports

The 1-Gigabit Ethernet ports consist of

- eight fixed MT-RJ style ports that are 1000BASE-SX compliant, and
- four port slots that support optional hot-swappable Mini-GBICs.

As of the printing of this manual, there were three Mini-GBIC models available: two that comply with standard 1000BASE-SX; one that complies with 1000BASE-LX.

10-Gigabit Ethernet Port

Caution: The expansion modules are **NOT** hot-swappable. The switch must be powered down before the expansion modules are installed or removed. Hot-swapping the expansion modules while the switch is powered on could cause the device to stop forwarding frames.

The 10-Gigabit Ethernet port is an expansion slot for a 10-Gigabit Ethernet expansion module. Depending on the Ethernet expansion module installed, the uplink can be via different connectors and media that support 10-Gigabit Ethernet operation.

Figure 1-2 shows the Ethernet expansion modules available at the time of this printing. Table 1-1 indicates which standard the modules comply with and the type of physical connections.

Figure 1-2 Optional Ethernet Expansion Modules

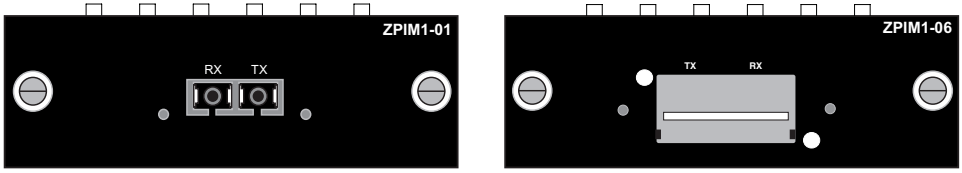


Table 1-1 Optional Ethernet Expansion Module, Compliance, and Physical Connection

Ethernet Expansion Module	Compliant to	Physical Connection
ZPIM1-01	10-Gigabit Ethernet	One fixed SC connector
ZPIM1-06	10-Gigabit Ethernet	One slot for an optional 10-Gigabit Ethernet (10 GbE) module with one fiber optic SC connector. This module must conform to the XENPAK 10 GbE standard.

1.3 MANAGEMENT

Management of the module can be either in-band or out-of-band. In-band remote management is possible using Telnet and Enterasys Networks' WebView application. Out-of-band management is provided through the RJ45 COM port on the front panel using a VT100 terminal or a VT100 terminal emulator.

1.3.1 Switch Configuration Using WebView

Enterasys Networks' HTTP-based Web management application (WebView) is an intuitive web tool for simple management tasks.

1.3.2 Switch Configuration Using CLI Commands

The CLI commands enable you to perform more complete switch configuration management tasks.

For information about the CLI command set, refer to the *Matrix E1 1G694-13 Configuration Guide*.

1.4 STANDARDS COMPATIBILITY

The 1G694-13 is fully compliant with the IEEE 802.3, 802.3ad, 802.3ae, 802.3u, 802.3x, 802.1D, and 802.1Q standards. The switch provides IEEE 802.1D Spanning Tree Algorithm (STA) support to enhance the overall reliability of the network and protect against “loop” conditions.

A full suite of Enterasys Networks Enterprise MIBs provide a wide array of statistical information to enhance troubleshooting. For information on how to extract and compile individual MIBs, contact Enterasys Networks (refer to Section 1.6 about getting help).

1.5 LANVIEW DIAGNOSTIC LEDs

LANVIEW diagnostic LEDs serve as an important troubleshooting aid by providing an easy way to observe the status of individual ports and overall network operations.

1.6 GETTING HELP

For additional support related to the modules or this document, contact Enterasys Networks using one of the following methods:

World Wide Web	http://www.enterasys.com/support
Phone	603-332-9400 1-800-872-8440 (toll-free in U.S. and Canada) For the Enterasys Networks Support toll-free number in your country: **http://www.enterasys.com/support/gtac-all.html**
Internet mail	support@enterasys.com To expedite your message, please type **[E-Series]** in the subject line.
To send comments or suggestions concerning this document to the Technical Writing Department: techwriting@enterasys.com To expedite your message, please include the document Part Number in the email message.	

Before contacting Enterasys Networks for technical support, have the following information ready:

- Your Enterasys Networks service contract number
- A description of the failure
- A description of any action(s) already taken to resolve the problem (for example, changing mode switches or rebooting the unit)
- The serial and revision numbers of all involved Enterasys Networks products in the network
- A description of your network environment (such as layout, cable type, other relevant environmental information)
- Network load and frame size at the time of trouble (if known)
- The device history (for example, if you have returned the device before, or if this a recurring problem)
- Any previous Return Material Authorization (RMA) numbers

2

Network Requirements

Before installing the switch, review the requirements and specifications referred to in this chapter concerning the following:

- 1000BASE-SX/LX network (Section 2.1)
- 10-Gigabit Ethernet network (Section 2.2)

The network installation must meet the requirements to ensure satisfactory performance of this equipment. Failure to do so will produce poor network performance.

Note: The *Matrix E1 1G694-13 Configuration Guide* and *Cabling Guide,* referred to in the following sections, can be found on the Enterasys Networks World Wide Web site: **http://www.enterasys.com/support/manuals**

2.1 1000BASE-SX/LX NETWORK

The fixed ports (1 through 8) are MT-RJ fiber optic ports that support 1000BASE-SX. The four port sockets (9 through 12) support optional Mini-GBICs. The Mini-GBICs enable you to vary the type of 1-Gbps ports. At the printing of this document there were three Mini-GBICs available: two that support 1000BASE-SX and one that supports 1000BASE-LX fiber optic connections. The device at the other end of the fiber connection must meet the 1-Gigabit Ethernet requirements for the devices to operate at Gigabit speed.

2.2 10-GIGABIT ETHERNET NETWORK

There is one optional 10-Gigabit interface port slot on the switch. Depending on the network application (e.g., network type and cabling) an optional expansion module can support different Ethernet connections.

As of the printing of this document, two models of 10-Gbps Ethernet expansion modules are available: ZPIM1-01 and ZPIM1-06.

The ZPIM1-01 has a fixed single port 850 nm Coarse Wave Division Multiplex interface with an SC connector, and can drive a signal to a maximum distance of 250 meters (820 feet) on a multimode fiber optic cable.

The ZPIM1-06 has a port slot that can support various optional XENPAK 10-Gigabit Ethernet (10 GbE) standard type fiber optic modules. Currently, only the 10GBASE-LR is available. This uplink has one 10-nanometer single mode fiber optic interface with an SC connector, and can drive a signal to a maximum distance of 10 kilometers (6.2 miles) on a single mode fiber optic cable.

The device at the other end of the fiber optic connection must be an Enterasys Networks product with a matching ZPIM1-01, or a standards compliant product with a 10GBASE-LR interface as appropriate.

3

Hardware Installation

Electrical Hazard: Only qualified personnel should install or service this unit.

Riesgo Eléctrico: Solamente personal capacitado debe de instalar o darle servicio a esta unida.

Elektrischer Gefahrenhinweis: Installationen oder Servicearbeiten sollten nur durch ausgebildetes und qualifiziertes Personal vorgenommen werden.

Note: Read the Release Notes shipped with the switch to check for any exceptions to the supported features and operation documented in this guide.

This chapter provides the instructions required to install the 1G694-13. Follow the order of the sections as listed below to correctly install the switch.

- Unpacking the switch (Section 3.2)
- Installing options (Section 3.3)
- Installing an optional Ethernet expansion module (Section 3.4)
- Installing an optional Mini-GBIC (Section 3.5)
- Installing an optional 10GBASE-LR (Section 3.6)
- Tabletop or shelf installation (Section 3.7)
- Rackmount installation (Section 3.8)
- Connecting to the network (Section 3.9)
- Connecting to the Console port for local management (Section 3.10)
- Completing the installation (Section 3.11)

3.1 REQUIRED TOOLS

A Phillips screwdriver is required to install the switch into a rack.

3.2 UNPACKING THE SWITCH

Unpack the switch as follows:

1. Open the box and remove the packing material protecting the switch.
2. Verify the contents of the carton as listed in Table 3-1.

Table 3-1 Contents of Shipping Carton

Item	Quantity
1G694-13	1
Antistatic Wrist Strap	1
DB9 to RJ45 Adapter	1
Rackmount Kit	1
Manual Accessory Kit	1
Power Cord	2

3. Remove the tape seal on the non-conductive bag to remove the switch.
4. Perform a visual inspection of the device for any signs of physical damage. Contact Enterasys Networks if there are any signs of damage. Refer to Section 1.6 for details.

3.3 INSTALLING OPTIONS

Note: If you are installing the 1G694-13 in a rack, it is recommended that you install an optional Ethernet expansion module or Mini-GBIC in the 1G694-13 first.

Caution: The expansion module is **NOT** hot-swappable. The switch must be powered down before the expansion module is installed or removed. Hot-swapping the expansion module while the switch is powered on could cause the device to stop forwarding frames.

The 1G694-13 has one expansion slot for an optional 10-Gigabit Ethernet expansion module and four expansion port slots for optional Mini-GBICs. For instructions to install an Ethernet expansion module, proceed to Section 3.4. To install a Mini-GBIC, proceed to Section 3.5.

3.4 INSTALLING AN OPTIONAL ETHERNET EXPANSION MODULE

Note: Install any optional equipment before proceeding to Section 3.7.

Installing an Ethernet expansion module involves the following:

- Removing the front panel coverplate (Section 3.4.1)
- Installing the Ethernet expansion module (Section 3.4.2)

Caution: An antistatic wrist strap is required to perform the following procedures to minimize ESD damage to the devices involved.

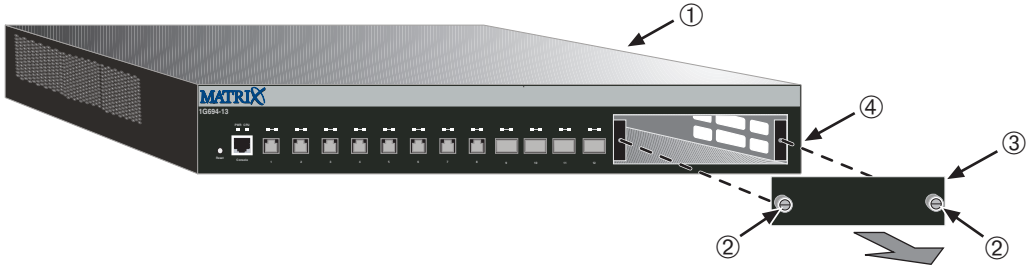
Precaución: Para minimizar los efectos de las descargas de electricidad estática, deberá utilizar una pulsera antiestática al realizar los siguiente procedimientos.

3.4.1 Removing the Front Panel Coverplate

Refer to Figure 3-1 and proceed as follows:

1. Attach the antistatic wrist strap (refer to the instructions on the antistatic wrist strap package).
2. Place the 1G694-13 ① on an antistatic pad (not shown) on a sturdy flat surface.
3. Loosen the two captive screws ② until the coverplate ③ is released from the front panel ④.
4. Remove the coverplate ③ from the front panel ④. Save the coverplate for future use if necessary.

Figure 3-1 Removing the Front Panel Coverplate



① 1G694-13
② Coverplate captive screws (2)
③ Coverplate
④ Front panel

3.4.2 Installing an Ethernet Expansion Module

Caution: Expansion modules are **NOT** hot-swappable. The switch must be powered down before an expansion module (ZPIM1-01 or ZPIM1-06) is installed or removed. Hot-swapping the expansion module while the switch is powered on could cause the device to stop forwarding frames.

Refer to Figure 3-2 and proceed as follows:

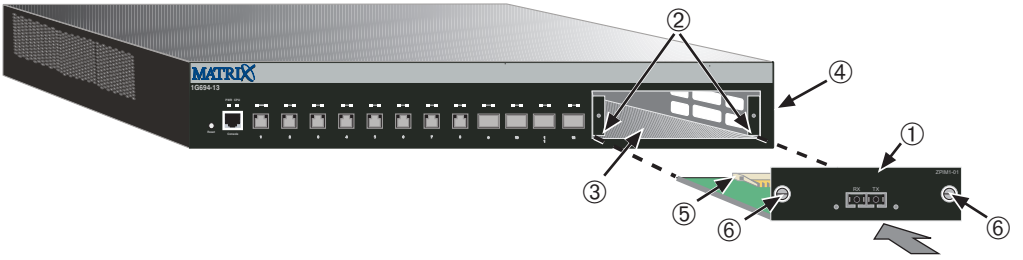
1. After completing the removal of the coverplate, align the Ethernet expansion module ① with the guides ② inside the option slot ③ in the 1G694-13 front panel ④. Then slide the Ethernet expansion module ① into the slot until its rear connector ⑤ is fully engaged.
2. Tighten the two captive screws ⑥ on the Ethernet expansion module ① to secure it to the 1G694-13 front panel ④.

This completes the Ethernet expansion module installation. If you are installing options, proceed as follows:

- To install a Mini-GBIC, proceed to Section 3.5.
- To install a XENPAK module (10GBASE-LR) in a ZPIM1-06 expansion module, proceed to Section 3.6.

Otherwise, proceed to Section 3.7 to install the 1G694-13 on a shelf or tabletop, or Section 3.8 to install the 1G694-13 into a standard 19-inch rack.

Figure 3-2 Installing the Ethernet Expansion Module



① Ethernet expansion module
② Guides
③ Option slot
④ 1G694-13 front panel
⑤ Rear connectors
⑥ Captive screws

3.5 INSTALLING AN OPTIONAL MINI-GBIC

This section describes how to install a Mini-GBIC.

Caution: Carefully follow the instructions in this manual to avoid damaging the Mini-GBIC and switch.

The Mini-GBIC and switch are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could result in damage to the Mini-GBIC and switch. Always leave the Mini-GBIC in the antistatic bag or an equivalent antistatic container when not installed.

To prepare and install a Mini-GBIC, proceed as follows:

Preparation

Before installing the Mini-GBIC, proceed as follows:

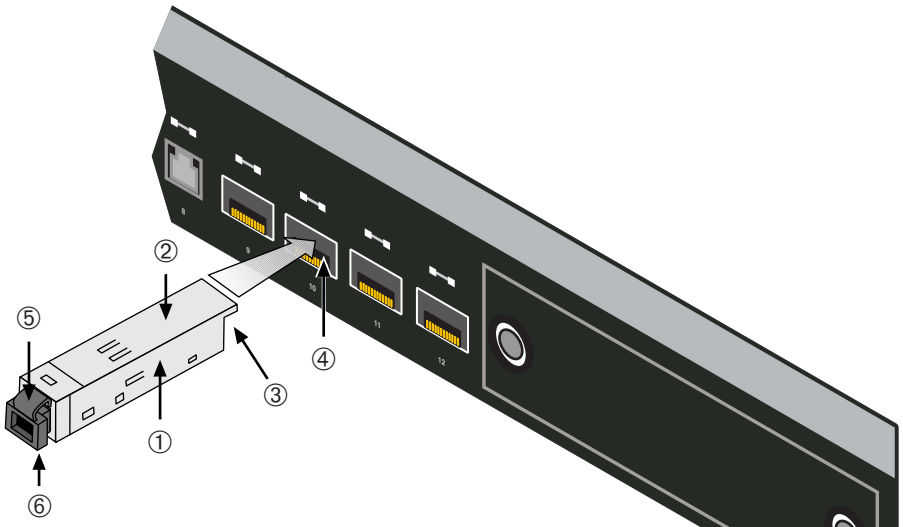
1. Attach the antistatic wrist strap (refer to the instructions in the antistatic wrist strap package) before removing the Mini-GBIC from the antistatic packaging.
2. Remove the Mini-GBIC from the packaging.
3. If there is a protective dust cover (see Figure 3-3, ⑤) on the Mini-GBIC port, do not remove it at this time.

Installation

To install a Mini-GBIC, refer to Figure 3-3 and proceed as follows:

1. Hold the Mini-GBIC ① with the top side ② facing up (as shown in Figure 3-3) and its 7-pin edge connector ③ facing the switch port slot ④.
2. Carefully align the Mini-GBIC ① with the switch port slot ④.
3. Push the Mini-GBIC ① into the switch port slot ④ until the Mini-GBIC “clicks” and locks into place. This completes the Mini-GBIC installation.

Figure 3-3 Mini-GBIC Installation



① Mini-GBIC
② Mini-GBIC, top side
③ 7-Pin edge connector (insertion side)
④ Switch port slot
⑤ Mini-GBIC, protective dust cover
⑥ Locking tab

Removing a Mini-GBIC

Caution: Do NOT remove a Mini-GBIC from a slot without releasing the locking tab located under the front bottom end of the Mini-GBIC. This can damage the Mini-GBIC.

The Mini-GBIC and switch are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so can result in damage to the Mini-GBIC and switch. Always leave the Mini-GBIC in the antistatic bag or an equivalent antistatic container when not installed.

To remove a Mini-GBIC from the switch, refer to Figure 3-3 and proceed as follows:

1. Attach the antistatic wrist strap (refer to the instructions in the antistatic wrist strap package) before removing the Mini-GBIC.
2. Remove the network cable connected to the Mini-GBIC.

3. Locate the locking tab ⑥ under the front end of the Mini-GBIC ①. Push in on the locking tab as far as it will go to release the Mini-GBIC from the switch port slot ④.
4. Grasp the sides of the Mini-GBIC ① and pull it straight out of the switch port slot ④.

If storing or shipping the Mini-GBIC, insert the protective dust cover ⑤ into the Mini-GBIC to protect the fiber ports.

3.6 INSTALLING AN OPTIONAL XENPAK (10GBASE-LR) MODULE

This section describes how to install a XENPAK module.

Caution: Carefully follow the instructions in this manual to avoid damaging the XENPAK module and switch.

The XENPAK module and switch are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could result in damage to the 10GBASE-LR and switch. Always leave the 10GBASE-LR in the antistatic bag or an equivalent antistatic container when not installed.

To prepare and install a XENPAK module, proceed as follows:

Preparation

Before installing the XENPAK module, proceed as follows:

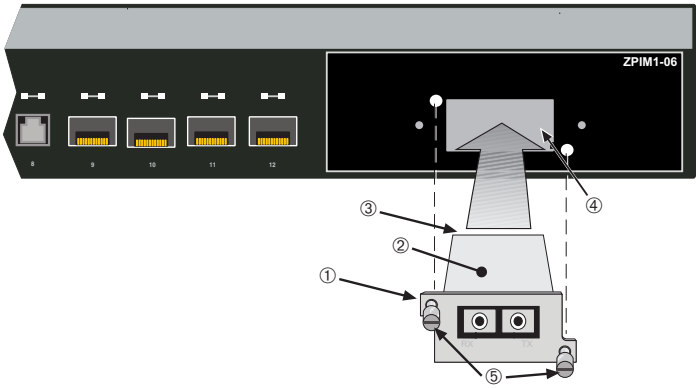
1. Attach the antistatic wrist strap (refer to the instructions in the antistatic wrist strap package) before removing the XENPAK module from the antistatic packaging.
2. Remove the XENPAK module from the packaging.

Installation

To install a XENPAK module, refer to Figure 3-4 and proceed as follows:

1. Hold the XENPAK module ① with the top side ② facing up (as shown in Figure 3-4) and its edge connector ③ facing the port slot ④.
2. Carefully align the XENPAK module ① with the port slot ④.
3. Push the XENPAK module ① into the switch port slot ④ until the back of the XENPAK module faceplate is flush against the Ethernet expansion module.
4. Turn the two thumbscrews ⑤ clockwise and tighten to secure the XENPAK module to the ZPIM1-06. This completes the XENPAK module installation.

Figure 3-4 XENPAK Module Installation



① 10GBASE-LR (XENPAK) module
② 10GBASE-LR (XENPAK), top side
③ Edge connector (insertion side)
④ Switch port slot
⑤ Thumbscrews (2)

Removing a XENPAK Module

Caution: The XENPAK module and switch are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so can result in damage to the XENPAK module and switch. Always leave the XENPAK module in the antistatic bag or an equivalent antistatic container when not installed.

To remove a XENPAK module from the switch, refer back to Figure 3-4 and proceed as follows:

1. Attach the antistatic wrist strap (refer to the instructions in the antistatic wrist strap package) before removing the XENPAK module ①.
2. Remove the network cable connected to the XENPAK module ①.
3. Turn the thumbscrews ⑤ counterclockwise to release the XENPAK module ① from the ZPIM1-06.
4. Grasp the thumbscrews ⑤ and pull the XENPAK module ① straight out of the switch port slot ④.
5. Before storing or shipping the XENPAK module ①, insert it into a static free container. This completes the removal procedure.

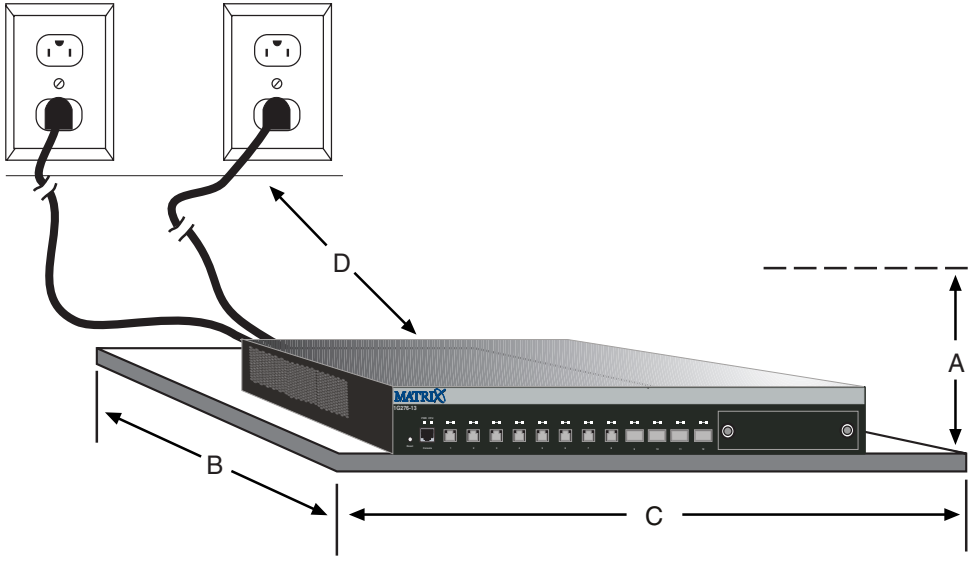
3.7 TABLETOP OR SHELF INSTALLATION

To install the switch on a tabletop or shelf, proceed as follows:

1. Place the switch upside down on a clean flat surface.
2. Locate the four self-stick rubber pads shipped with your switch, then affix one near each corner of the switch. The rubber pads serve as rubber feet to protect the surface of the table or shelf. They also help prevent the switch from sliding out of place on the flat surface.
3. Locate the switch within seven feet of its power source and on an unrestricted free surface area as shown in Figure 3-5. Proceed to Section 3.8.1 for power connection instructions.

Caution: To ensure proper ventilation and prevent overheating, leave a minimum clearance space of 5.1 cm (2.0 in.) at the left, right, and rear of the switch.

Figure 3-5 Clearance Required for Tabletop or Shelf Installation



A 11.74 cm (4.625 in)
B 40.32 cm (15.875 in)
C 54.60 cm (21.5 in)
D 213.00 cm (7 ft)

3.8 RACKMOUNT INSTALLATION

To install the switch in a 19-inch rack, an accessory kit containing the rackmount brackets, and mounting screws to attach the rackmount brackets are shipped with the switch.

Guidelines for Rackmount Installation

The installation site must be within reach of the network cabling and meet the requirements listed below:

- Appropriate grounded power receptacles must be located within seven feet of the location.
- A temperature of between 5°C (41°F) and 40°C (104°F) must be maintained at the installation site with fluctuations of less than 10°C (18°F) per hour.

Caution: To ensure proper ventilation and prevent overheating, leave a minimum clearance space of 5.1 cm (2.0 in.) at the left, right, and rear of the device.

Precaución: Para asegurar una buena ventilación y evitar que el sistema se sobrecaliente, deje un espacio mínimo de 5.1 cm (2 pulgadas) con respecto a los lados y a la parte posterior del aparato.

Warning: Before installing the chassis into a rack, ensure that the rack can support the device(s) without compromising the stability of the rack. Otherwise, personal injury and/or equipment damage may result.

Advertencia: Antes de instalar el chassis en un rack, asegurarse que el rack puede soportar el(los) dispositivo(s) sin comprometer la estabilidad del mismo. De otra forma puede suceder algun tipo de daño personal o del equipo.

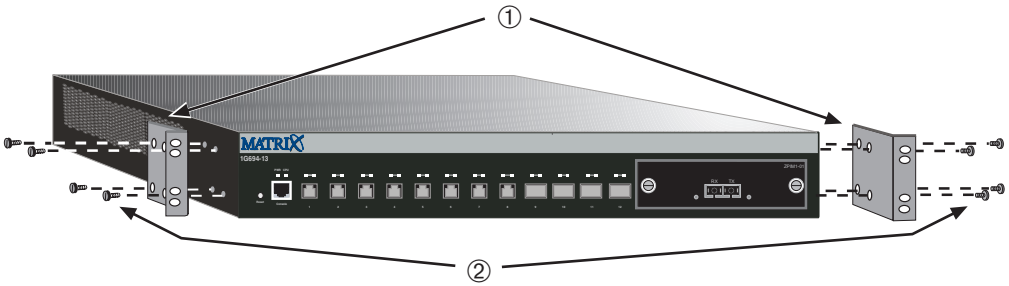
Warnhinweis: Schützen Sie sich vor Verletzungen und Geräteschaden, überzeugen Sie sich vor der Installation des Chassis in das Rack, von dessen Stabilität.

Installation

Proceed as follows to install the switch into a 19-inch rack:

1. Attach the rackmount brackets ① to the switch, as shown in Figure 3-6, using the eight M3 x 6 mm flathead screws ② from the rackmount kit.

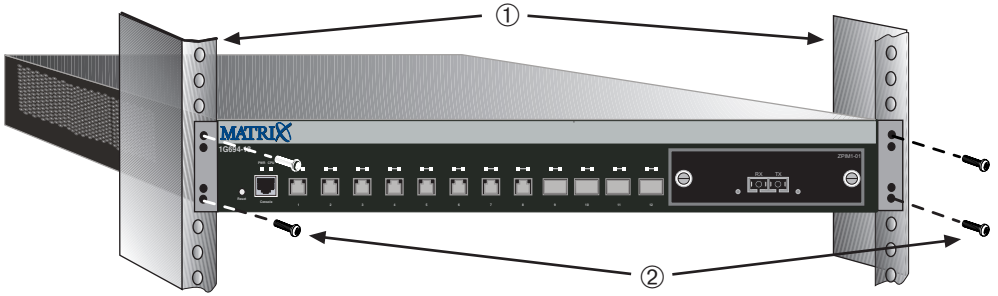
Figure 3-6 Attaching the Rackmount Brackets



① Rackmount brackets ② M3 x 6 mm flathead screws (8)

2. Position the switch between the rails of the 19-inch rack ① as shown in Figure 3-7. Then fasten the switch securely to the frame using four mounting screws ② (user supplied).

Figure 3-7 Fastening the Switch to the Rack



① Rails of 19-inch rack ② Mounting screws (4)(supplied by user)

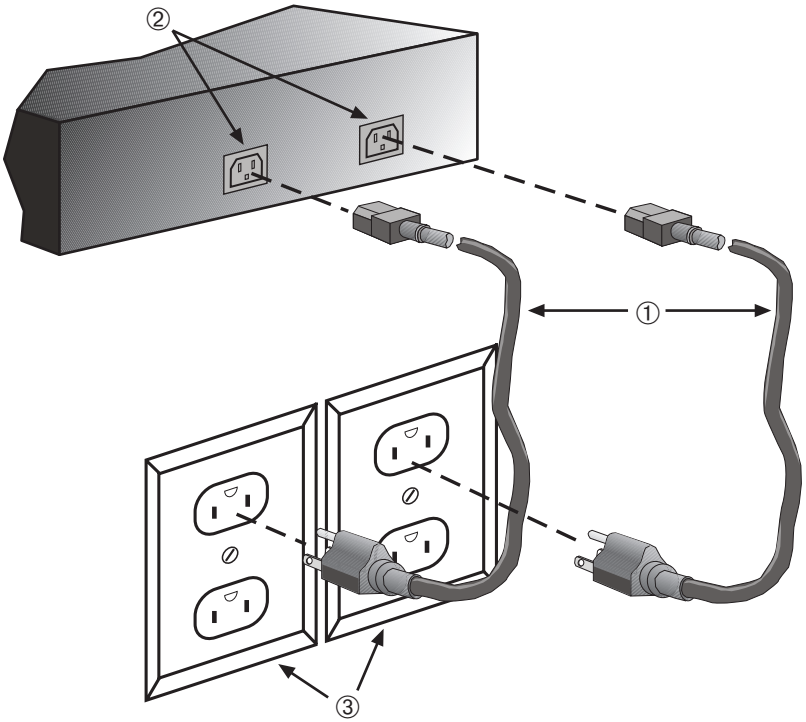
3.8.1 Connecting Power

Note: The two power supplies in the switch have automatic voltage sensing, which allows connection to power sources ranging from 100–125 Vac, 2.5 A or 200–240 Vac, 1.25 A, 50/60 Hz.

To connect the switch to the power sources, refer to Figure 3-8 and proceed as follows:

1. Plug each power cord ① into an ac power receptacle ② in the switch, then into a grounded ac outlet ③ as shown in Figure 3-8. To take advantage of the redundancy capability, each power cord must be plugged into a separate dedicated ac outlet ③.

Figure 3-8 AC Power Connections



① AC power cords
② AC power receptacles
③ Grounded AC outlets (Each outlet is on a separate circuit)

2. Observe the LANVIEW LEDs. The Power (PWR) LED, located on the front panel, turns ON (green) and the CPU turns red until the switch is initialized. It takes approximately one minute for the switch to boot up.

If the initialization process is successful, the CPU LED turns green. If the CPU LED remains solid red, blinking red, or blinking amber, refer to Chapter 4 for troubleshooting information.

3.9 CONNECTING TO THE NETWORK

The following procedures cover the cable connections from the network or other devices to the fixed MT-RJ front panel ports, optional Mini-GBIC or an SC port on an optional Ethernet expansion module.

- Connecting Fiber Optic Cables to MT-RJ Ports (Section 3.9.1)
- Connecting Fiber Optic Cables to an SC port (Section 3.9.2)

3.9.1 Connecting Fiber Optic Cables to MT-RJ Ports

This section provides the procedure for connecting 1-Gigabit Ethernet multimode fiber optic segments from the network or other devices to the fixed front panel MT-RJ ports, or to Mini-GBIC MT-RJ ports. The procedure is the same in either case.

Each fiber optic link consists of two fiber optic strands within the cable:

- Transmit (TX)
- Receive (RX)

The transmit strand from a switch port connects to the receive port of a fiber optic Gigabit Ethernet device at the other end of the segment. The receive strand of the applicable MT-RJ port on the switch connects to the transmit port of the fiber optic Gigabit Ethernet device.

The following procedure describes how to connect an MT-RJ cable connector to a Mini-GBIC MT-RJ port connector. This procedure also applies to the eight fixed MT-RJ ports. Refer to Figure 3-9 and proceed as follows:

1. Remove the protective covers (not shown) from the MT-RJ fiber optic port on the Mini-GBIC ① and from the connectors on each end of the cable.

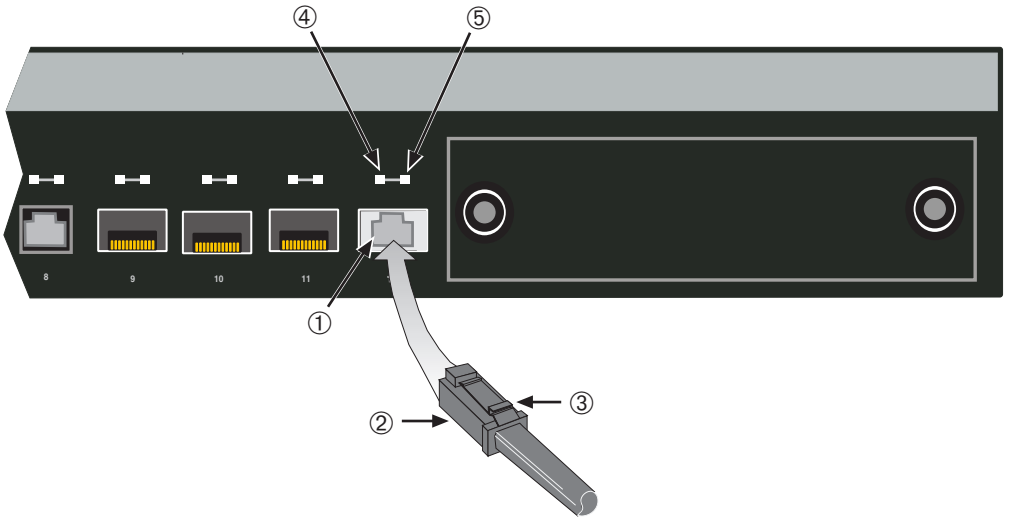
Note: Leave the protective covers in place when the connectors are not in use to prevent contamination.

Caution: Do not touch the ends of the fiber optic strands, and do not let the ends come in contact with dust, dirt, or other contaminants. Contamination of cable ends causes problems in data transmissions. If the ends of the fiber optic strands become contaminated, use a canned duster to blow the surfaces clean. A fiber port cleaning swab saturated with optical-grade isopropyl alcohol may also be used to clean the ends.

2. Insert the MT-RJ cable connector ② into the Mini-GBIC ① until it clicks into place.

Note: To remove the MT-RJ cable connector ②, press on its release tab ③ and pull it out of the Mini-GBIC.

Figure 3-9 Cable Connection to Mini-GBIC



① Installed Mini-GBIC
② MT-RJ cable connector
③ Release tab
④ Receive LED (RX)
⑤ Transmit LED (TX)

3. Plug the other end of the cable into the appropriate port on the other device. Some cables may be terminated at the other end with two separate connectors, one for each fiber optic strand. In this case, ensure that the transmit fiber optic strand is connected to the receive port and the receive fiber optic strand to the transmit port.

4. Verify that a link exists by checking that the port **RX** LED is on (flashing amber, blinking green, or solid green). If the **RX** LED is off, perform the following steps until it is on:

   a. Verify that the device at the other end of the segment is ON and connected to the segment.

   b. If there are separate fiber optic connections on the other device, check the crossover of the cables. Swap the cable connections if necessary.

   c. Check that the fiber optic connection meets the dB loss and cable specifications outlined in the *Cabling Guide* for multimode fiber optic cabling. To obtain this document, refer to Section 1.6.

   If a link has not been established, refer to Chapter 4 for LED troubleshooting details. If a problem persists, refer to "Getting Help" in Chapter 1 for details on contacting Enterasys Networks for support.

5. Repeat steps 1 through 3, above, until all connections have been made.

3.9.2 Connecting Fiber Optic Cables to an SC Port

The optional ZPIM1-01 and 10GBASE-LR have an SC style connector for a cable connection to a 10-Gigabit Ethernet network. Enterasys Networks offers fiber optic cables that use SC style connectors, which are keyed to ensure proper crossover of the transmit and receive fibers.

Note: An odd number of crossovers (preferably one) must be maintained between like devices so that the transmit port of one device is connected to the receive port of the other device and vice versa.

3.9.3 Network Connection Using Fiber Optic Cable

The following instructions apply to SC connections of either the ZPIM1-01 or 10GBASE-LR module installed in a ZPIM1-06. In this procedure connection to ZPIM1-01 is used as an example.

To connect the switch to the network, perform the following steps:

1. Remove any protective covers from the fiber optic ports and from the ends of the connectors.

Warning: Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

Advertencia: No se debe usar instrumentos opticos para ver la potencia laser. El uso de los instrumentos opticos para ver la potencia laser incrementa el riesgo a los ojos. Cuando vean el puerto de la potencia optica, la corriente debe ser removida del adaptador de la red.

Warnhinweis: Benutzen sie keinesfalls optische Hilfmittel, um die Funktion des Lasers zu überprüfen. Solche Hilfsmittel erhöhen die Gefahr von Sehschäden. Wenn sie den optischen Port überprüfen möchten stellen Sie sicher, dass die Komponente von der Spannungsversorgung getrennt ist.

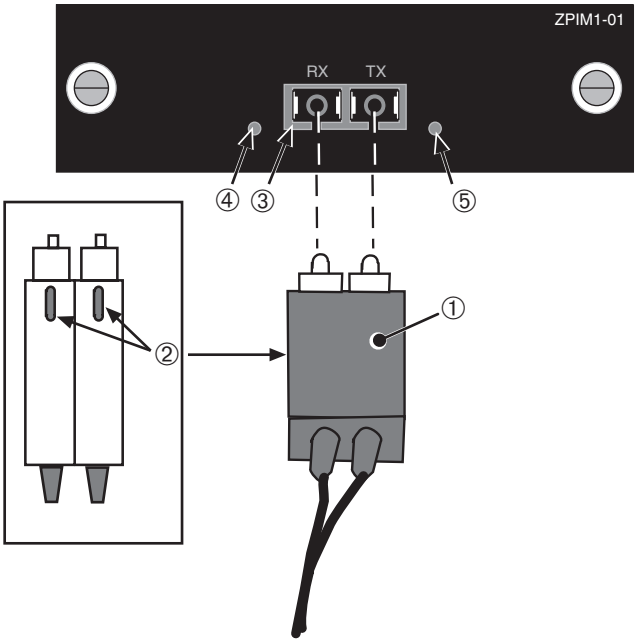
Caution: To prevent contaminating the end of strands in the connectors or ports, leave the protective covers in place when the connectors or ports are not in use.

Do not touch the ends of the fiber optic strands, and do not let the ends come in contact with dust, dirt, or other contaminants. Contamination of the ends causes problems in data transmission.

If the ends become contaminated, blow the surfaces clean with a canned duster. A fiber port cleaning swab saturated with optical-grade isopropyl alcohol may also be used to clean the ends.

2. Refer to Figure 3-10 and insert one end of the SC cable connector ①, key side down ②, into the SC port interface connector ③. Ensure that the appropriate cable is used for the application of the SC port connection. Refer to Appendix A for the appropriate fiber optic cable to be used in the installation.

Figure 3-10 SC Fiber Optic Cable Connection



① SC cable connector
② Latch keys (bottom of SC connector)
③ SC port Interface connector
④ Link LED (RX)
⑤ Activity LED (TX)

3. At the other end of the fiber optic cable, attach the SC connector to the other device.
4. Verify that a link exists by checking that the port **RX** LED ④ is on (flashing amber, blinking green, or solid green). If the **RX** LED is off, there is no link. Perform the following steps until it is on:
   a. Check that the device at the other end of the link has power turned on and is compatible.
   b. Verify proper crossover of fiber strands between the port on the switch and the fiber optic device at the other end of the fiber optic link segment.

c. Verify that the fiber optic cable meets the specifications outlined in Appendix A for the installed Ethernet expansion module.

To remove the SC cable connector from the interface port, carefully pull the connector out of the port. It may need to be loosened by gently moving from side to side to release the latching keys.

If a link has not been established, refer to Chapter 4 for LED troubleshooting details. Refer to Section 1.6 for details on contacting Enterasys Networks for support.

3.10 CONNECTING TO CONSOLE PORT FOR LOCAL MANAGEMENT

This section describes how to install a UTP cable with RJ45 connectors and optional adapters to connect a PC, a VT series terminal, or a modem to an Enterasys Networks module to access Local Management. This section also provides the pinout assignments of the adapters.

3.10.1 What Is Needed

One RJ45-to-DB9 female adapter (supplied with the switch).

The following is a list of the user-supplied parts that may be needed depending on the connection:

- UTP cable with RJ45 connectors
- RJ45-to-DB25 female adapter (PN 9372110)
- RJ45-to-DB25 male adapter (PN 9372112)

With a UTP cable with RJ45 connectors and RJ45-to-DB9 adapter, you can connect products equipped with an RJ45 console port to an IBM or compatible PC running a VT series emulation software package.

With a UTP cable and an optional RJ45-to-DB25 female adapter (PN 9372110), you can connect products equipped with an RJ45 console port to a VT series terminal or VT type terminals running emulation programs for the VT series.

With a UTP cable and an optional RJ45-to-DB25 male adapter (PN 9372112), you can connect products equipped with an RJ45 console port to a Hayes compatible modem that supports 9600 baud.

3.10.2 Connecting to an IBM or Compatible Device

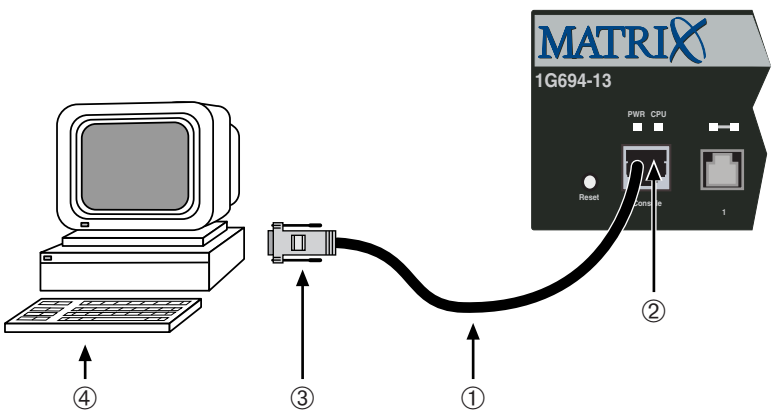
To connect an IBM PC or compatible device, running the VT terminal emulation, to an Enterasys Networks module Console port (Figure 3-11), proceed as follows:

1. Connect the RJ45 connector at one end of the cable (not supplied) to the Console port on the Enterasys Networks module.
2. Plug the RJ45 connector at the other end of the cable into the RJ45-to-DB9 adapter (supplied with the switch).
3. Connect the RJ45-to-DB9 adapter to the communications port on the PC.
4. Turn on the PC and configure your VT emulation package with the following parameters:

Parameter	Setting
Mode	7 Bit Control
Transmit	Transmit=9600
Bits Parity	8 Bits, No Parity
Stop Bit	1 Stop Bit

5. When these parameters are set, the Local Management password screen will appear. Refer to the appropriate *Matrix E1 1G694-13 Configuration Guide* for further information.

Figure 3-11 Connecting an IBM PC or Compatible



① UTP cable with RJ45 connector
② RJ45 console port
③ RJ45-to-DB9 PC adapter
④ PC

3.10.3 Connecting to a VT Series Terminal

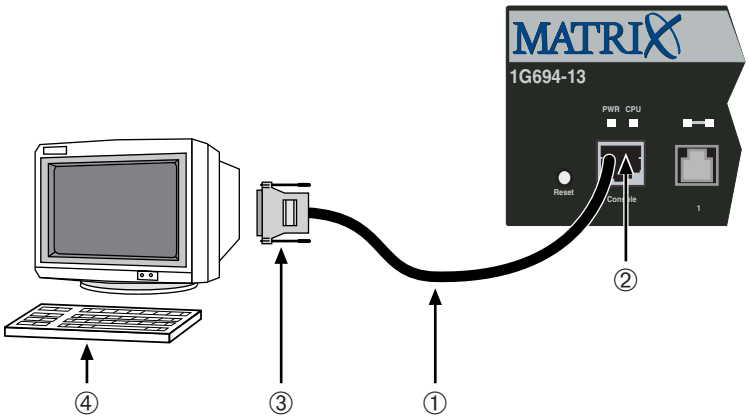
To connect a VT Series terminal to an Enterasys Networks switch Console port (Figure 3-12), use a UTP cable with RJ45 connectors and an **optional** RJ45-to-DB25 female adapter (PN 9372110), and proceed as follows:

1. Connect the RJ45 connector at one end of the cable ① to the Console port ② on the Enterasys Networks switch.
2. Plug the RJ45 connector at the other end of the cable ① into the RJ45-to-DB25 female adapter ③.
3. Connect the RJ45-to-DB25 adapter ③ to the port labeled COMM on the VT terminal ④.
4. Turn on the terminal and access the Setup Directory. Set the following parameters on your terminal:

Parameter	Setting
Mode	7 Bit Control
Transmit	Transmit=9600
Bits Parity	8 Bits, No Parity
Stop Bit	1 Stop Bit

When these parameters are set, the Local Management password screen will display. Refer to the *Matrix E1 1G694-13 Configuration Guide* for further information.

Figure 3-12 Connecting a VT Series Terminal



① UTP cable with RJ45 connector
② RJ45 Console Port
③ RJ45-to-DB25 VT adapter
④ VT series terminal

3.10.4 Connecting to a Modem

To connect a modem to an Enterasys Networks switch Console port (Figure 3-13), use a UTP cable with RJ45 connectors and an **optional** RJ45-to-DB25 male adapter (PN 9372112), and proceed as follows:

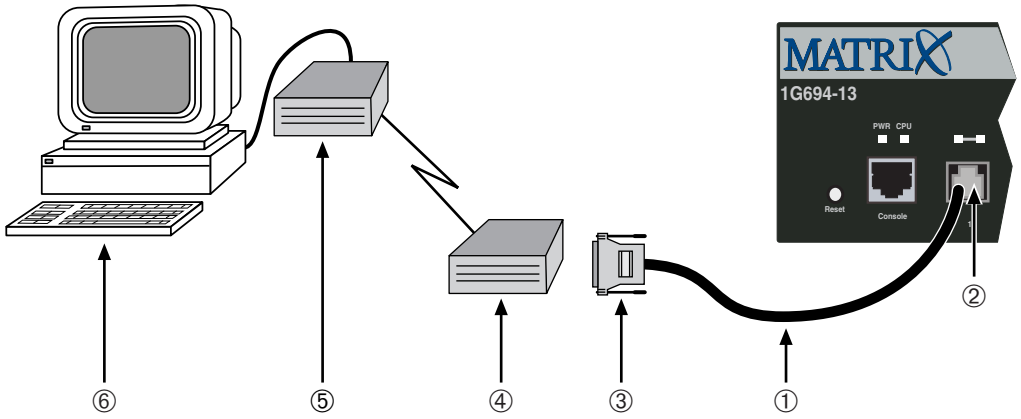
1. Connect the RJ45 connector at one end of the cable ① to the Console port ② on the Enterasys Networks switch.
2. Plug the RJ45 connector at the other end of the cable ① into the RJ45-to-DB25 male adapter ③.
3. Connect the RJ45-to-DB25 adapter ③ to the communications port on the modem ④.
4. Turn on the modem ④.

5. With a PC ⑥ connected to a remote modem ⑤, you can configure the switch remotely. To accomplish this, you must configure your PC VT emulation package with the following parameters.

Parameter	Setting
Mode	7 Bit Control
Transmit	Transmit=9600
Bits Parity	8 Bits, No Parity
Stop Bit	1 Stop Bit

6. When these parameters are set, the Local Management password screen will display. Refer to the *Matrix E1 1G694-13 Configuration Guide* for further information.

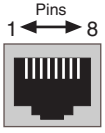
Figure 3-13 Connecting to a Modem



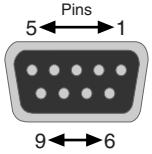
① UTP cable with RJ45 connector
② RJ45 console port
③ RJ45-to-DB25 modem adapter
④ Local modem
⑤ Remote modem
⑥ PC

3.10.5 Adapter Wiring and Signal Assignments

Console Port Adapter Wiring and Signal Diagram			
RJ45		**DB9**	
Pin	Conductor	Pin	Signal
1	Blue	2	Receive (RX)
4	Red	3	Transmit (TX)
5	Green	5	Ground (GRD)
2	Orange	7	Request to Send (RTS)
6	Yellow	8	Clear to Send (CTS)

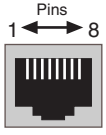


RJ45 Connector (Female)

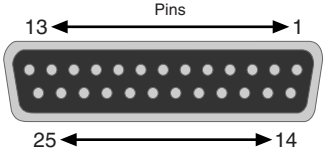


DB9 Connector (Female)

VT Series Port Adapter Wiring and Signal Diagram			
RJ45		**DB25**	
Pin	Conductor	Pin	Signal
4	Red	2	Transmit (TX)
1	Blue	3	Receive (RX)
6	Yellow	5	Clear to Send (CTS)
5	Green	7	Ground (GRD)
2	Orange	20	Data Terminal Ready

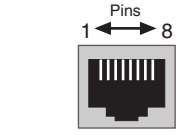


RJ45 Connector (Female)

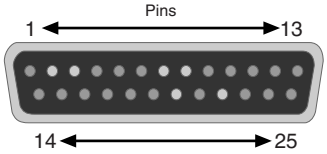


DB25 Connector (Female)

Modem Port Adapter Wiring and Signal Diagram			
RJ45		**DB25**	
Pin	Conductor	Pin	Signal
1	Blue	2	Transmit (TX)
2	Orange	8	Data Carrier Detect (DCD)
4	Red	3	Receive
5	Green	7	Ground (GRD)
6	Yellow	20	Data Terminal Ready (DTR)
8	Gray	22	Ring Indicator



RJ45 Connector (Female)



DB25 Connector (Male)

3.11 COMPLETING THE INSTALLATION

After installing the 1G694-13 and making the connections to the network, secure the cables by running the cables along the strain-relief bracket and tying them to the strain-relief bracket using cable ties.

Initial Logon to Device Management

For the initial logon to the 1G694-13, use the console port and configure the switch using the command line interface (CLI). To initially access the device management from your local pc, terminal, or modem connection, follow the instructions below:

1. Enter **rw** (Read-Write) for Username.
2. At the Password prompt, press **Enter** (**Return**).

For details on how to configure the 1G694-13 using the command line interface, refer to the *Matrix E1 1G694-13 Configuration Guide*. The CLI commands enable you to initially set up and perform more involved switch management configurations.

After the initial configuration, you can also use WebView (Enterasys Networks' embedded web server) for configuration and management tasks, refer to the *Matrix E1 1G694-13 WebView User's Guide*.

The guides are available online at:

http://www.enterasys.com/support/manuals

If you require assistance, contact Enterasys Networks using one of the methods described in "Getting Help" in Section 1.6.

4

Troubleshooting

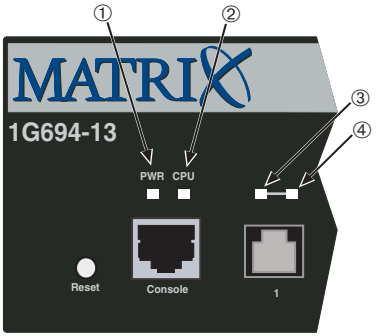
This chapter provides information concerning the following:

- Using LANVIEW (Section 4.1)
- Troubleshooting checklist (Section 4.2)
- Using the Reset button (Section 4.3)

4.1 USING LANVIEW

The 1G694-13 switch uses the Enterasys Networks built-in visual diagnostic and status monitoring system called LANVIEW. The LANVIEW LEDs (Figure 4-1) allow you to quickly observe network status for diagnosing network problems.

Figure 4-1 LANVIEW LEDs



① PWR LED
② CPU LED
③ Port RX LED
④ Port TX LED

Table 4-1 describes the LED indications and the associated recommended actions.

NOTE: The terms **flashing**, **blinking**, and **solid** used in Table 4-1 indicate the following:

Flashing: LED is flashing randomly.

Blinking: LED is flashing at a steady rate (approximately 50% on, 50% off).

Solid: LED is on steady and not pulsing.

Table 4-1 LANVIEW LEDs

LED	Color	State	Recommended Action
PWR	Off	No power.	Ensure that the switch has adequate power.
	Amber	**Solid**. Power supply functional not in redundant mode.	**1.** Ensure that the power cords are plugged in correctly and that there is power at the two power sources. **2.** Contact Enterasys Networks for technical support.
	Green	**Solid**. Power supplies are functioning and are in the redundant mode.	None.
CPU	Red	**Blinking**. Hardware failure has occurred.	Contact Enterasys Networks for technical support.
		Solid. Resetting, normal power up reset.	If the LED remains Red for several minutes, the system may have a fatal error. Contact Enterasys Networks for technical support.
	Amber	**Blinking**. Crippled.	Contact Enterasys Networks for technical support.
		Solid. Testing.	If the LED remains amber for more than several minutes, contact Enterasys Networks for technical support.
	Green	**Solid**. Functional.	None.
	Amber and Green	**Booting**. Blinks amber and green while booting.	None.

Table 4-1 LANVIEW LEDs (Continued)

LED	Color	State	Recommended Action
Port RX	Off	**No link**.	None.
	Green	**Solid**. Link, port enabled, no activity.	None.
		Blinking. Link, port disabled.	None.
	Amber	**Flashing** or **Solid**. Link, port enabled, activity.	None.
	Red	**Solid**. Diagnostic failure.	Contact Enterasys Networks for assistance.
Port TX	Off	No activity.	
	Green	**Flashing** or **Solid**. Indicates activity. Flashing rate indicates data rate.	None.
	Red	**Solid**. Diagnostic failure.	Contact Enterasys Networks for technical support.

4.2 TROUBLESHOOTING CHECKLIST

If the switch is not working properly, refer to Table 4-2 for a checklist of problems, possible causes, and recommended actions to resolve the problem.

Table 4-2 Troubleshooting Checklist

Problem	Possible Cause	Recommended Action
All LEDs are OFF.	Loss of power.	Ensure that the switch was installed properly according to the installation instructions in Chapter 3, and that the switch has power.
No CLI prompt.	Incorrect terminal setup.	Refer to the *Matrix E1 1G694-13 Configuration Guide* for proper setup procedures.
	Improper console cable pinouts.	Refer to Appendix A for proper Console port pinouts.
	Corrupt firmware image, or hardware fault.	If possible, attempt to download the image to the switch again. Refer to Section B.3 for instructions to clear NVRAM.
Cannot log in.	Improper Community Names Table.	Refer to the *Matrix E1 1G694-13 Configuration Guide* for the Community Names Table setup. If the Community Names have been forgotten, refer to Section B.3 for instructions on how to set the mode switch to reset the Community Names to their default values.

Table 4-2 Troubleshooting Checklist (Continued)

Problem	Possible Cause	Recommended Action
Cannot contact the switch through in-band management.	IP address not assigned.	Refer to the *Matrix E1 1G694-13 Configuration Guide* for the IP address assignment procedure.
	Port is disabled.	Enable port. Refer to the *Matrix E1 1G694-13 Configuration Guide* for instructions to enable/disable ports.
	No link to device.	Verify that all network connections between the network management station and the switch are valid and operating. If the problem continues, contact Enterasys Networks for technical support.
Port(s) goes into standby for no apparent reason.	Loop condition detected.	Verify that Spanning Tree is enabled. Refer to *Matrix E1 1G694-13 Configuration Guide* for the instructions to set the type of STA. Review the network design and delete unnecessary loops. If the problem continues, contact Enterasys Networks for technical support.
User parameters (IP address, device and module name, etc.) were lost when the switch power was cycled or the front panel Reset button was pressed.	Position of Mode switch (7), NVRAM Reset, was changed sometime before either cycling power or pressing the Reset button, causing the user-entered parameters to reset to factory default settings. Clear NVRAM was set using CLI commands.	Reenter the lost parameters as necessary. Refer to *Matrix E1 1G694-13 Configuration Guide* for the instructions to configure the device through Local Management. If the problem continues, contact Enterasys Networks for technical support.

4.3 USING THE RESET BUTTON

The Reset button shown in Figure 4-2 resets and re-initializes the switch.

Caution: Pressing the Reset button resets the device, and all current switching being performed by the switch is halted. A network downtime of up to two minutes will result from this action for any devices connected to the switch.

Figure 4-2 Reset Switch

① Reset Button

A

Specifications

This appendix provides information about the following:

- 1G694-13 specifications (Section A.1)
- ZPIM1-01/ZPIM1-06 10-Gigabit Ethernet port interface specifications (Section A.2)
- Input/output specifications for the 10GBASE-LR (Section A.3)
- Mini-GBIC input/output specifications (Section A.4)
- Gigabit Ethernet specifications (Section A.5)
- Console port pinout assignment (Section A.6)
- Regulatory compliance (Section A.7)

Enterasys Networks reserves the right to change the specifications at any time without notice.

A.1 1G694-13 SPECIFICATIONS

Table A-1 provides the I/O ports, processors and memory, physical, and environmental module specifications for the 1G694-13.

Table A-1 1G694-13 Specifications

Item	Specification
Ports	
Ports 1 through 8	Eight fixed, 1000BASE-SX compliant MT-RJ ports
Ports 9 through 12	Four Mini-GBIC port slots for 1000BASE-SX or -LX compliant Mini-GBICs
Port Interface Option Slot	Supports one optional 10-Gigabit Ethernet expansion module
Processors/Memory	
Processors	MPC8240, 200 MHz processor
Dynamic Random Access Memory (DRAM)	64 MB
FLASH Memory	8 MB
Physical	
Dimensions	6.6H x 43.8W x 38.73D (cm) 2.62H x 17.25W x 15.25D (in.)
Approximate Weight	Gross: 8.05 kg (17.7 lb) (shipping carton containing one device) Net: 2.89 kg (6.4 lb) (one device without packaging)
MTBF (Predicted)	41,658 hours
Environmental	
Operating Temperature	5°C to 40°C (41°F to 104°F)
Storage Temperature	-30°C to 73°C (-22°F to 164°F)
Operating Relative Humidity	5% to 90% (non-condensing)

A.2 ZPIM1-01/ZPIM1-06, 10-GIGABIT PORT INTERFACE SPECIFICATIONS

As of the printing of this manual, two expansion modules (ZPIM1-01 and ZPIM1-06) were available from Enterasys Networks. Table A-2 and Table A-3 provide the specifications.

Warning: The ZPIM1-01 uses Class 1 lasers. Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

Advertencia: No se debe usar instrumentos opticos para ver la potencia laser. El uso de los instrumentos opticos para ver la potencia laser incrementa el riesgo a los ojos. Cuando vean el puerto de la potencia optica, la corriente debe ser removida del adaptador de la red.

Warnhinweis: Benutzen sie keinesfalls optische Hilfmittel, um die Funktion des Lasers zu überprüfen. Solche Hilfsmittel erhöhen die Gefahr von Sehschäden. Wenn sie den optischen Port überprüfen möchten stellen Sie sicher, dass die Komponente von der Spannungsversorgung getrennt ist.

Table A-2 ZPIM1-01/ZPIM1-06 Port/Environmental Specifications

Item	Specification
ZPIM1-01 Port	10-Gigabit Ethernet with a standard duplex SC connector.
ZPIM1-06 Port	10-Gigabit Ethernet option slot for XENPAK-compliant devices.
Environmental	
Operating Temperature	5°C to 40°C (41°F to 104°F)
Storage Temperature	-30°C to 73°C (-22°F to 164°F)
Operating Relative Humidity	5% to 90% (non-condensing)

Table A-3 ZPIM1-01 Optical Specifications

Parameter	Data Rate	Minimum	Maximum	Units
Fiber Length – 62.5 installed (160MHz/km)	4 x 3.1875	2	80	m
Fiber Length – 50 micron standard (500MHz/km)	4 x 3.1875	2	250	m
Fiber Length – 50 micron (850 optimized, 2200MHz/km)	4 x 3.1875	2	550	m

A.3 INPUT/OUTPUT SPECIFICATIONS FOR THE 10GBASE-LR

The ZPIM1-06 option slot supports XENPAK 10-Gigabit Ethernet (GbE) standard (802.3ae) interface plug-in modules. These modules are hot swappable. Table A-4 through Table A-6 provide the specifications for the 10GBASE-LR module, which is the only module available as of the printing of this manual.

Warning: The 10GBASE-LR uses Class 1 lasers. Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

Advertencia: No se debe usar instrumentos opticos para ver la potencia laser. El uso de los instrumentos opticos para ver la potencia laser incrementa el riesgo a los ojos. Cuando vean el puerto de la potencia optica, la corriente debe ser removida del adaptador de la red.

Warnhinweis: Benutzen sie keinesfalls optische Hilfmittel, um die Funktion des Lasers zu überprüfen. Solche Hilfsmittel erhöhen die Gefahr von Sehschäden. Wenn sie den optischen Port überprüfen möchten stellen Sie sicher, dass die Komponente von der Spannungsversorgung getrennt ist.

Table A-4 Port Input/Output Specifications

Item	Specification
10GBASE-LR	Provides one SC fiber optic single-mode port that is compliant with the 10 GbE standard SC connector.

Table A-5 10GBASE-LR Optical Specifications

Item	10 µm MMF
Transmit Power (minimum)	-9.5 dBm
Receive Sensitivity	-20 dBm
Link Power Budget	10.5 dBm

Table A-6 10GBASE-LR Operating Range

Item	Modal Bandwidth @ 1300 nm	Range
10 µm SMF	N/A	2-10,000 Meters

A.4 MINI-GBIC INPUT/OUTPUT SPECIFICATIONS

The Mini-Gigabit Ethernet Card (Mini-GBIC) port interface slots can support 1-Gbps fiber-optic and copper connections as described in Table A-7. The optional Mini-GBICs are hot swappable.

Table A-7 Mini-GBIC Input/Output Port Specifications

Item	Specification
MGBIC-LC01	Provides one LC fiber-optic multimode port that is compliant with the 1000BASE-SX standard LC connector.
MGBIC-LC03	Provides one LC fiber-optic multimode port that is compliant with the 1000BASE-SX standard LC duplex style connector.
MGBIC-LC09	Provides one LC fiber-optic single-mode port that is compliant with the 1000BASE-LX standard LC connector.
MGBIC-MT01	Provides one MT-RJ fiber-optic multi-mode port that is compliant with the 1000BASE-SX standard MT-RJ connector.
MGBIC-08	Provides one LC fiber-optic single-mode port that is compliant with the 1000BASE-ELX standard LC connector.
MGBIC-02	Provides one RJ45 copper connection that is compliant with the 1000BASE-T standard RJ45 connector.

A.5 GIGABIT ETHERNET SPECIFICATIONS

The following specifications for the Mini-GBICs (shown in Table A-8 through Table A-16) meet or exceed the IEEE 802.3z-1998 standard.

A.5.1 MGBIC-LC01/MGBIC-MT01 Specifications (1000BASE-SX)

Table A-8 MGBIC-LC01 / MGBIC-MT01 Optical Specifications

Item	62.5 µm MMF	50 µm MMF
Transmit Power (minimum)	-9.5 dBm	-9.5 dBm
Receive Sensitivity	-17 dBm	-17 dBm
Link Power Budget	7.5 dBm	7.5 dBm

Table A-9 MGBIC-LC01 / MGBIC-MT01 Operating Range

Item	Modal Bandwidth @ 850 nm	Range
62.5 µm MMF	160 MHz/km	2-220 Meters
62.5 µm MMF	200 MHz/km	2-275 Meters
50 µm MMF	400 MHz/km	2-500 Meters
50 µm MMF	500 MHz/km	2-550 Meters

A.5.2 MGBIC-LC03 Specifications (1000BASE-SX)

Table A-10 MGBIC-LC03 Optical Specifications

Item	62.5/125 µm MMF	50/125 µm MMF
Transmit Power (minimum)	-9.5 dBm	-9.5 dBm
Transmit Power (maximum)	-3 dBm	-3 dBm
Receive Sensitivity	-20 dBm	-20 dBm
Link Power Budget[1] (Multimode Only)	10.5 dBm	10.5 dBm

1. The maximum drive distance (up to 2 km) depends on the quality of the installed multimode fiber-optic cable segment. Use the Link Power Budget to calculate the maximum cable length of the attached segment. The Link Power Budget must not exceed those specified in this table. The MGBIC-LC03 input power must not exceed -3 dBm. Otherwise, saturation could occur.

Table A-11 MGBIC-LC03 Operating Range

Item	Modal Bandwidth @ 1310 nm	Range
62.5 µm MMF	160 MHz/km	2,000 Meters
50 µm MMF	400 MHz/km	2,000 Meters

A.5.3 MGBIC-LC09 Specifications (1000BASE-LX)

Table A-12 MGBIC-LC09 Optical Specifications

Item	62.5 µm MMF	50 µm MMF	10 µm MMF
Transmit Power (minimum)	-11.5 dBm	-11.5 dBm	-9.5 dBm
Receive Sensitivity	-20 dBm	-20 dBm	-20 dBm
Link Power Budget	8.5 dBm	8.5 dBm	10.5 dBm

Table A-13 MGBIC-LC09 Operating Range

Item	Modal Bandwidth @ 1300 nm	Range
62.5 µm MMF	500 MHz/km	2-550 Meters
50 µm MMF	400 MHz/km	2-550 Meters
50 µm MMF	500 MHz/km	2-550 Meters
10 µm SMF	N/A	2-10,000 Meters

A.5.4 MGBIC-08 Specifications (1000BASE-ELX)

Table A-14 MGBIC-08 Optical Specifications

Item			
Transmit Power (minimum)	-0 dBm, min.	+2 dBm, typical	+5 dBm, max.
Receive Sensitivity	-24 dBm, min.	-26 dBm, typical	
Maximum Input Power	-3 dBm		
Link Power Budget[1] (Full Duplex Only)	23 dB	28 dB, typical	

1. The maximum drive distance (up to 70 km) depends on the quality of the installed single-mode fiber-optic cable segment. Use the Link Power Budget to calculate the maximum cable length of the attached segment. The Link Power Budget must not exceed those specified in this table. The MGBIC-08 input power must not exceed -3 dBm. Otherwise, saturation could occur.

Table A-15 MGBIC-08 Operating Range

Item	1550 nm	Range
9 or 10 µm SMF	N/A	70,000 Meters

A.5.5 MGBIC-02 Specifications (1000BASE-T)

Table A-16 MGBIC-02 / Specifications

Item	Specification
Supported Cable	
Type: Maximum Length	Copper, Category 5 UTP Up to 100 meters
Connector	RJ45
Data Rate	1 Gbps, IEEE 802.3:2000 compatible 1000BASE-T operation only Automatic crossover detection
TX Output impedance	100 ohms, typical at all frequencies between 1 MHz and 125 MHz
RX Input impedance	100 ohms, typical at all frequencies between 1 MHz and 125 Hz

A.6 RJ45 COM PORT PINOUT ASSIGNMENTS

The COM port is a serial communications port that supports Local Management. Table A-17 shows the COM port pin assignments.

Table A-17 Console Port Pin Assignments

Pin	Signal Name	Input/Output
1	Transmit Data (XMT)	Output
2	Clear to Send (CTS)	Input
3	Data Set Ready (DSR)	Input
4	Receive Data (RCV)	Input
5	Signal Ground (GND)	NA
6	Request to Send (RTS)	Output
7	Data Terminal Ready (DTR)	Output
8	Data Carrier Detect (DCD)	Input

A.7 REGULATORY COMPLIANCE

The 1G694-13 meets the safety and electromagnetic compatibility (EMC) requirements listed in Table A-18:

Table A-18 Compliance Standards

Regulatory Compliance	Standards
Safety	UL 60950, CSA C22.2 No. 60950, 73/23/EEC, EN 60950, IEC 60950, EN 60825, 21 CFR 1040.10.
Electromagnetic Compatibility (EMC)	47 CFR Parts 2 and 15, CSA C108.8, 89/336/EEC, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024, AS/NZS CISPR 22, VCCI V-3.

B

Mode Switch Bank Settings

Electrical Hazard: Only qualified service personnel should attempt the following procedures.

Riesgo Electrico: Solamente personal calificado debe intentar este procedimiento.

Elektrischer Gefahrenhinweis: Nur qualifiezierte service personnal die folgende procedure folgen sollten.

The top cover of the 1G694-13 chassis must be removed to gain access to the mode bank switches.

This appendix covers the following items:

- Required tools (Section B.1)
- Removing the chassis cover (Section B.2)
- Locations, functions, and settings for the mode switches (Section B.3)

B.1 REQUIRED TOOLS

Use the following tools to perform the procedures provided in this appendix:

- Antistatic wrist strap
- Phillips screwdriver

B.2 REMOVING THE CHASSIS COVER

This section describes how to remove the chassis cover.

Electrical Hazard: Do not remove the cover from the 1G694-13 while power is applied to the unit. Hazardous voltages are present and could cause personal injury and/or damage the unit.

Do not power up the 1G694-13 again until the cover and screws are in place.

Riesgo Electrico: No debe de remover la tapa durente que este coneltado a la corriente. Una descarga electrica le puede causar y probocarle daños, al igual que al aparato.

No enchufe a la corriente hasta que la tapa y los tornillos esten en su lugar.

Elektrischer Gefahrenhinweis: Deckel von das 1G694-13 nicht abziehen unter spannung. Gefahr für das personnal und/oder das gerät wegen gefährliche spannungen ensteht.

1G694-13 nicheinschalten so lang der deckel und schrauben nicht eingebaut sind.

Electrical Hazard: This unit may have more than one power supply cord. Disconnect two power supply cords before servicing to avoid electric shock.

Riesgo Electrico: Cet appareil comporte plus d'un cordon d'alimentation. Rafin de prevenir les chocs electriques, degrancher les deux cordons d'alimentation avant de faire le depannage.

Elektrischer Gefahrenhinweis: Dieses gerät hat mehr als einen netzanschluß. Trennen sie vor wartungsarbeiten die 2 net zanschlüsse vom netz, um elektrische schläge zu vermeiden.

To remove the chassis cover, refer to Figure B-1 and proceed as follows:

1. Disconnect the switch from the network as follows:
   a. Unplug both power cords from the rear of the chassis.

Electrical Hazard: Turn off the 1G694-13 by unplugging the power cord from the rear of the chassis.

Riesgo Electrico: Apague el 1G694-13 desenchufe el cable de la unidad.

Elektrischer Gefahrenhinweis: Am hinten des 1G694-13 stechei abziehen um aus zu schalten.

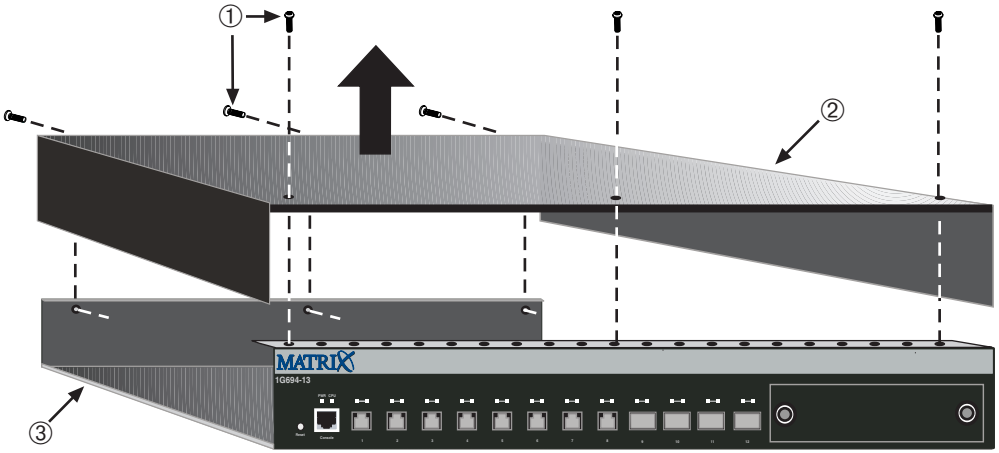
Tip: Before performing step b, mark the cables connected to the switch according to their associated port numbers. This is recommended for ease of reinstallation.

   b. Disconnect all network cables attached to the switch.
2. If the chassis is rack mounted, remove it from the rack (refer to Chapter 3).
3. Use a Phillips screwdriver to remove the 6 screws ① attaching the cover ② to the chassis ③. (See Figure B-1.)

4. Remove the cover ② by lifting it straight up and off the chassis ③.

To reinstall the chassis cover, perform the removal procedures in reverse.

Figure B-1 Removing the Chassis Cover



① Cover Screws (6) ② Cover ③ Chassis

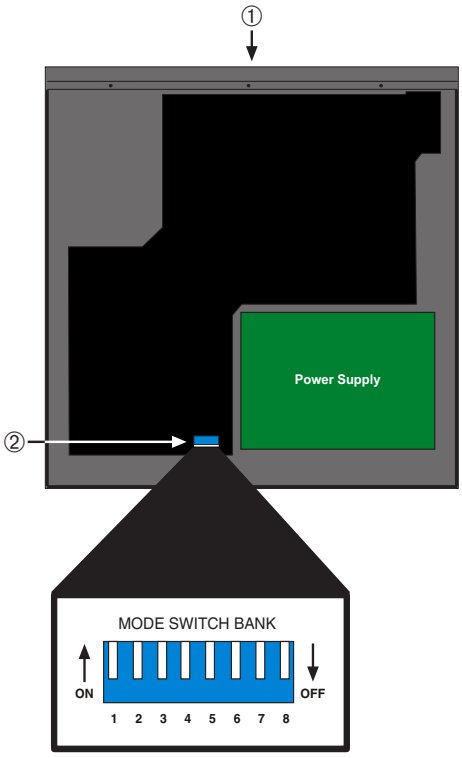
B.3 SETTING THE MODE SWITCHES

Figure B-2 shows the location of the mode switches and the switch settings for normal operation. These switches are set at the factory and rarely need to be changed.

Switch definitions and positions are as follows:

- Switches 1 through 5 – Reserved for future use.

Figure B-2 Mode Switch Location (Chassis, Top View)



① Front panel ② Mode switch bank

- Switch 6 – Force Download. Changing the position of this switch initiates an Xmodem download of the functional image via the console port on the next power-up of the device. You must connect the console port to a terminal emulator that supports the Xmodem protocol (such as HyperTerminal).

- Switch 7 – Clear NVRAM. Changing the position of this switch resets NVRAM on the next power-up of the device. All user-entered parameters, such as the IP address, device names, etc., are reset to the factory default settings. Once the switch resets, you can either use the factory default settings or reenter your own parameters.
- Switch 8 – Reset Password/Community Names. Changing the position of this switch clears user-entered passwords stored in NVRAM, and restores the factory default passwords on the next power-up of the device. Once the switch resets, you can either use the factory default settings or reenter your own passwords.

Note: Do not change the position of Switch 8 unless it is necessary to reset the module super-user configured passwords to their factory default settings.

Index

Numerics

1000BASE-SX/LX network connections
  requirements for 2-1
10GBASE-LR module
  installing 3-7
  specifications for A-4
10-Gigabit Ethernet port
  introduction to 1-2
1G694-13
  overview of the 1-1
  unpacking of the 3-2
1-Gigabit Ethernet
  introduction to 1-2

A

Accessing mode switch bank B-2

C

Cable
  Fiber Budget A-5
  Fiber budget A-4
Cable specifications
  1000BASE-SX/LX network 2-1
Chassis cover
  removal of B-2
CLI commands
  introduction to 1-3
COM port
  pin assignments for A-9
Connecting to the network
  instructions for 3-13
Connectivity
  introduction to 1-2
CPU LED
  function of 4-3

D

Document conventions xvi

E

Electromagnetic Compatibility (EMC)
    requirements A-9
Ethernet expansion module
  installation of 3-3

F

Fiber budget A-4, A-5
Front panel 1-1

G

Getting help
  methods for 1-5

H

Hardware installation
  required tools for 3-1

I

Installation
  connecting to the network 3-13
  in a rack 3-10
  optional Ethernet expansion module 3-3
  optional Mini-GBIC 3-5
  SC to fiber optic network cable connection 3-15

L

LANVIEW
use of 4-2
Local Management
introduction to 1-3

M

Management
use of 1-3
MGBIC-08
specifications for A-7
Mini-GBIC
installation of 3-5
specifications for A-4, A-5
Mode Switch
setting of B-4
Mode Switch Bank Settings B-1
MT-RJ Ports
connecting fiber optic cables to 3-13

N

Notices
General ii

O

Options
installation of 3-2
introduction to 3-2

P

Port RX LED
function of 4-4
Port TX LED
function of 4-4
Ports
10-Gigabit Ethernet 1-2
1-Gigabit Ethernet 1-2
Power connections
instructions for 3-12
PWR LED
function of 4-3

R

Rackmount
instructions for 3-10
Regulatory compliance A-9
Related manuals xv
Reset button
use of 4-7

S

Safety requirements A-9
SC port
connecting fiber optic cables to 3-13
Specifications A-1
10GBASE-LR module A-4
Mini-GBICs A-4, A-5
ZPIM1-01 A-3
ZPIM1-06 A-3
Specifications, MGBIC-08 A-7
Specifications, MGBIC-LC01
operating range A-6
optical A-5, A-8
Specifications, MGBIC-LC09
operating range A-4, A-7, A-8
optical A-7
Specifications, MGBIC-MT01
operating range A-6
optical A-5, A-6
Standards compatibility 1-4

T

Troubleshooting 4-2
checklist 4-5

U

Unpacking 3-2

W

WebView
introduction to 1-3

X

XENPAK module
  installing 3-7

Z

ZPIM1-01
  compliance & physical condition 1-3
  connecting to network 3-15
  installing 3-4
ZPIM1-06
  compliance & physical condition 1-3
  connecting to network 3-15
  installing 3-4